

## 5.17 MONITORING

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Monitoring of Lake Tahoe, its tributary surface and ground waters, and pollutant sources such as atmospheric deposition and stormwater is a very important part of the implementation program. Long-term monitoring of an "Index Station" in Lake Tahoe by the University of California at Davis' Tahoe Research Group has documented the trends in clarity and productivity shown in Figures 5-1 and 5-2. Further long-term monitoring is essential to document progress toward attainment of the water quality standards for these parameters, which are based on 1968-71 figures.

Monitoring and special studies have been carried out in the Tahoe Basin by a variety of agencies (including the U.S. Forest Service's Lake Tahoe Basin Management Unit, the California Department of Water Resources, the University of Nevada at Reno, and the U.S. Geological Survey), but long-term records are available only for Lake Tahoe and a few tributary streams. In response to the recommendations of the 1980 *Lake Tahoe Basin Water Quality Plan*, special studies were carried out on sewer exfiltration into ground water, nearshore phytoplankton and periphyton productivity in Lake Tahoe, and atmospheric deposition. The *Water Quality Management Plan for the Lake Tahoe Region* ("208 Plan," Volume I) contains a summary of the results of water quality monitoring and special studies through 1988. The State Board organized the Lake Tahoe Interagency Monitoring Program in 1979; annual reports of this program have been published by the University of California at Davis' Institute of Ecology. The U.S. Forest Service's Lake Tahoe Basin Management Unit monitors water quality impacts of a variety of land use activities on National Forest lands. The Tahoe Research Group is using data from the Interagency Monitoring Program to construct a model of the nutrient budget of Lake Tahoe.

The 208 Plan (Vol. I, page 177) directs the Tahoe Regional Planning Agency (TRPA) to maintain an operational monitoring program, consisting of planning and administration, data collection, data storage and retrieval, and data analysis, and to use the products of the program to identify problems and evaluate progress under TRPA's Regional Plan. The monitoring program shall include continuous scientific monitoring of environmental conditions related to the

thresholds for pelagic Lake Tahoe, littoral Lake Tahoe, tributary streams, surface runoff, ground water, land coverage, and SEZs. TRPA also monitors tributary streams as one of the conditions of implementing the Individual Parcel Evaluation System (IPES); see the section of this Chapter on land capability.

The TRPA currently has responsibility for coordinating the Lake Tahoe Interagency Monitoring Program, with the advice of an interagency technical advisory committee. Recent additions to the program include monitoring of "other lakes" than Lake Tahoe (including Fallen Leaf, Echo, and Cascade Lakes). TRPA has also sponsored a study on fish habitat in Lake Tahoe and the impacts of nearshore human activities on habitat quality. As a condition of approval of the 208 Plan, the State Board directed TRPA to conduct additional monitoring and to publish annual reports summarizing monitoring results.

The 208 Plan identifies future research needs including details of Lake Tahoe's nutrient budget, the nutrient inputs and outputs of the watershed and the airshed, and the effectiveness of BMPs and other control measures. Specifically, research needs have been identified in the following areas: (1) development of a database on the treatment of runoff in natural and artificial wetlands and SEZs, (2) the quantity and quality of urban runoff and the contributions of urban runoff to Lake Tahoe's nutrient budget, (3) effectiveness of erosion and runoff control projects, (4) transport of airborne nutrients, particularly nitrogen, from upwind areas into the Tahoe Region, (5) effects of fertilizer use on water quality and effectiveness of fertilizer management programs, and (6) effectiveness of Stream Environment Zone restoration projects and techniques.

Regional Board staff have been carrying out a stormwater monitoring program for remedial erosion control projects which were implemented with State Assistance Program (SAP) funding. Results will be used to evaluate the success of the projects. Several other studies of the effectiveness of BMPs for erosion/stormwater control in the Lake Tahoe Basin were in progress in 1993. Additional needs for monitoring and research in the Lake Tahoe Basin identified by Regional Board staff include: (1) further study of the role of ground water in nutrient loading to Lake Tahoe, (2) baseline biological monitoring in all types of water bodies, (3) monitoring of priority pollutants in surface runoff, and sediment sampling in

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marinas for priority pollutants and tributyltin, and (4) follow-up on the shoreline erosion study which began in the 1980s.

Together with long-term continuation of the basic Lake Tahoe Interagency Monitoring Program, such special studies will enable evaluation of the adequacy of existing control programs and the need for new control measures to ensure attainment and maintenance of standards. Additional monitoring and research will also provide the basis for: (1) the establishment of numerical nutrient objectives for additional water bodies, (2) the establishment of biological, and possibly sediment quality objectives, and (3) the update of the regional runoff guidelines to include priority pollutants.